THE
VETERINARY JOURNAL

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THE "DOCTORATE" OF VETERINARY MEDICINE.

THE degree of Doctor of Veterinary Medicine has recently been granted to our French Colleagues, and for some years the same privilege has been accorded to graduates in Veterinary Science in Germany and Switzerland. Although a number of English and Colonial (especially South African) graduates have taken this degree, it is not universally known that it is open to members of the British Veterinary Schools. For the benefit of those of our young graduates who have ambitions in that direction, and who are willing to spend six (or nine) months in postgraduate study with this object, and at the same time to improve their knowledge of French or German, we give, in another part of this Journal, the summaries of several of these regulations. Further particulars can be obtained without any difficulty by writing to the respective secretaries of the Universities concerned.

This question is of more than ordinary interest, and it is a very opportune moment for our profession to consider the matter of a Bri.ish Veterinary Doctorate. The late International Veterinary Congress brought it into the limelight again, as a very high proportion of the Delegates who attended were entitled to place the magic title of Dr. in front of their respective names, i.e. the Veterinary Doctorate. The profession in other countries has already realised the advantage of this, especially from the social side, and it is for us to consider whether we shall move in the matter and thus remove the reproach of having to tell the young aspirant to this degree that, in order to acquire the distinction, he must reside and study in another country.

It is a matter which does not end with the student or the recent

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graduate, as one has also to consider those of our colleagues from the Colonies who come to England on " study " leave. Where can they obtain the fulfilment of their ambition to take back with them, when they return, tangible evidence of the work they have done ? France, Germany, and Switzerland are all pleasant countries in which to spend an instructive holiday, and in any of these the British graduate is a welcome student ; but, after all, to the Englishman there is no place like England, and it is a standing reproach that we have no similar degree to which the M.R.C.V.S. may aspire without having to spend his leave away from his relatives and friends. Perhaps some of our readers will forward their views upon the subject ; either privately, or, if desired, for publication.

It is a subject worthy of serious discussion.

THE EARLY HISTORY OF VETERINARY LITERATURE (VOLUME III).

As our readers know full well we have for some time set aside a certain number of pages of each issue of THE VETERINARY JOURNAL for the publication of the third volume of the masterly work of that distinguished veterinary historian, the late Major-General Sir Frederick Smith, and in this way we have given those members of the profession who are subscribers to the Journal an opportunity to acquire a literary treatise of great value without additional expense, other than the mere cost of binding.*

The work itself was a labour of love on the part of the author, ably assisted by two literary colleagues, Dr. Fred Bullock, upon whom devolved especially the responsibility of completing the task, and Professor Tom Hare that of obtaining the illustrations. To these three the profession owes a debt of gratitude for having rescued from oblivion a history of the profession during the period under review, and there is a still further instalment which Sir Frederick Smith had already started upon, and which is yet in manuscript. The work could not, however, have been attempted in these days of high wages and expensive printing, had it not been for the generosity of the publishers, Messrs. Baillière, Tindall & Cox, whose long loyalty to the Veterinary Profession now extends to three generations. To them we owe a debt of gratitude too, and we are sure that we shall not have any dissentient voices if we publicly express it. They have done their part well and the profession appreciates it.

* A small number of bound copies will be available for purchase ; and in regard to the loose folios, special binding cases can be obtained upon application to Messrs. Baillière, Tindall & Cox, Henrietta Street, Covent Garden, London, W.C.

General Articles

REGULATIONS FOR ADMISSION TO THE DOCTORATE DEGREE OF THE BERLIN VETERINARY SCHOOL.

Graduates of other nationalities can obtain the Doctorate of Veterinary Medicine of the Veterinary High School of Berlin if they show :

1st—that they have a preparatory training which according to the decision of the Ministers of Agriculture, Domains, and Forestry, is equivalent to that demanded in Germany for matriculation in the study of Veterinary Science.

2nd—that they have attended and studied at a recognised Veterinary High School, or a Veterinary Medicine Faculty of a Foreign University, similar to that assigned in Germany ; and have completed and attended veterinary lectures for at least two semesters in Germany.

The amount of fees for students depends on the number of lecture courses attended. For 10 hours a week study the cost amounts to 50 Reichsmarks for each semester.

THE DOCTORATE OF VETERINARY MEDICINE, UNIVERSITY OF ZURICH.

The time necessary for investigations and for writing the dissertation depends on the ability and intentions of the candidate and on the problem. But as a rule not more than one or two semesters are needed—that means 4 to 10 months. The dissertation is preferred in German. The summer semester lasts from about April 20th to July 20th, the winter semester from about October 20th to February 28th. But the candidate may start his laboratory or clinical work at any time of the year and usually commences at the beginning of the ordinary courses. The candidate is matriculated like any other student, and in this case he has certain advantages regarding theatres and sickness insurance. He follows a course in " ful practicum " under the professor whose special course he has chosen (surgery, bacteriology, pathology, etc.). He may enter his name for any other course or lectures of interest. Conditions for matriculation : The candidate should bring with him the matriculation certificate of his Veterinary College or University, and the diploma which entitles him to practise.

Fees : Matriculation 32.0 fr. (only once).
Semester taxes 22.0 fr. pro semester.
Ful practicum 125.0 fr. „ „

Eventually : other courses or lectures Fr. 6.0 per hour per week, per semester (for instance a student follows a post-mortem course 6 hours a week, he pays 36.0 frcs.).

The expenses of living in a pension (room and food) amount to about 220.0–250.0 fr. a month. Students living on a somewhat higher standard pay 300 fr.

The Secretary of the University will be glad to give any other information.

CONDITIONS OF THE VETERINARY FACULTY OF THE UNIVERSITY OF LEIPZIG, FOR THE DEGREE OF DOCTOR OF VETERINARY MEDICINE.

I

The candidate must deliver a thesis in the German language which must furnish proof of his training and capacity for individual work in the field of Veterinary Medicine. This thesis must be submitted to the Governing Authority of the Veterinary Faculty. Permission to present the thesis in a foreign language depends on the consent of the Faculty. The work must show careful literary preparation and quotations from foreign authors must be acknowledged.

The Dean of the Veterinary Faculty hands over the thesis to an associate (or member) of the Faculty for criticism, and to a second one for a contemporary report. The opinion is given in writing. If the judgment is favourable the admission to the Doctorate examination is granted. If on the contrary the reporters are of opposite opinions and cannot reach agreement the thesis is placed before the collective body of the members of the Faculty. A majority in favour of the thesis grants the writer admission to the examination.

To the thesis are added :

(*a*) The matriculation certificate.

(*b*) The approval form (in the original or an attested copy).

(*c*) A description of the career and course of education of the candidate.

(*d*) An assurance of the candidate that the thesis, apart from the references indicated, has been produced by his own efforts, and that he has not already submitted it for an examination, or for any similar object. In treatises whose material has been collected from a University, High School, Institute, or Research Institute the permission of the Director must be obtained for the material to be used for the inaugural dissertation. The same applies to material which includes cases from the practice of another Veterinary Surgeon.

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II

Conditions of Examination in the case of a candidate who does not possess a German veterinary qualification :—

In the absence of any German veterinary qualification, on special grounds and on unanimous resolution of the entire Faculty, with consent of the Minister of Education, the following may be admitted to the Doctorate examination.

(*a*) those belonging to Germany.

(*b*) those belonging to the outer German States.

A candidate belonging to either of these groups has to show :

1st—proof of having satisfactorily completed a course at a German Gymnasium, or a German Upper High School ; or a corresponding proof for a foreigner from a recognised school of equal educational standing to these mentioned.

2nd—proof of eight terms' attendance at the ordained theoretical and practical study of a Veterinary Medical Faculty, or Veterinary High School.

3rd—a declaration on his word of honour that without previously obtaining the German Approval he will not engage in practice in Germany.

The description of the candidate's career and the accompanying declaration as regards the thesis must be given.

Foreigners, besides this, have to furnish an authentic and witnessed report, and to submit proof that they have studied at least one semester at the Veterinary Faculty in Leipzig.

Foreign candidates who cannot present any of the above proofs can supply evidence that they possess the preparatory education for the acquisition of the Doctor of Veterinary Medicine degree demanded in their own country ; and that they possess the Veterinary Certificate or Diploma. The decision regarding this rests with the Minister of Education. The manuscript furnished by candidates will be considered by the whole Faculty in conference, and must be unanimously accepted.

The judgment on the thesis furnished will be given in writing according to paragraph 2 and will also be laid before the members of the whole faculty.

If the opinion is favourable admission to the examination is granted. The thesis and career are printed and conditions settled. One hundred and fifty reprints of the dissertation have to be handed over before receiving the Diploma of the Faculty.

The examination is oral and consists of a practical (clinical) and a theoretical part. The practical part precedes the theoretical part. The candidate must have passed both sections of the practical examin-

ation to be admitted to the theoretical portion. The result will be given in writing and sent to the Dean after the examination. This condition is necessary for admission.

Six examiners conduct the theoretical part of the examination. The Dean presides over the examination and can himself act as an examiner.

The theoretical examination includes :

1—Anatomy.

2—Physiology.

3—Pathological anatomy including general pathology.

4—Pharmacology including general therapy.

5—Hygiene.

6—Zootechny.

Each candidate is examined separately. The examination is public. Notes are taken of the examination and signed by all the examiners.

If the candidate does not pass he may present himself again after a lapse of six months. If he doesn't pass on the second occasion he is not allowed another chance.

The charges for promotion, including the cost of the diploma and office fees, are fixed by the University of Education. At present they are 30 to 50 Reichsmarks. This sum is handed over to the office of the Veterinary Faculty when the thesis is presented. Should the thesis be returned as unsatisfactory the candidate is refunded two thirds of the fee. Should the candidate not pass the examination or for any reason only undergo part of the oral examination he will receive back half of the sum paid.

VETERINARY SCIENCE IN THE RUSSIAN EMPIRE AND IN THE UNION OF SOVIET SOCIALIST REPUBLICS.*

By PROFESSOR W. KONGE,

Director of the Veterinary Institute, Leningrad.

In the development and origin of Veterinary Science in the Russian Empire and in the U.S.S.R. one can differentiate three well defined and independent periods ; the commencing duties of which coincided with : (1) The opening of Veterinary Schools [1840] and the supplying of the country with scientifically-trained specialists ; (2) The introduction of Zemstvos [Committees of Local Government, and of County, District and Rural Councils] in 1864 ; and (3) The organization of Veterinary Science in the Soviet Union.

* Translated by Dr. Henry Fox, D.Sc. (Kharkov), M.R.C.V.S.

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During the first period Veterinary Service, organized by the Government, had to deal exclusively with the practical application of legislative measures formed for the eradication of dangerous and prevalent epizoötics which existed at that time, especially rinderpest, anthrax and glanders.

The Central Veterinary Department, set up for that special purpose, was severely handicapped by the fact that there was only a very limited number of veterinary personnel available for field work : one Veterinary Surgeon for each Province, and a very limited number of Veterinary Inspectors stationed at the important centres to control rinderpest and other epizoötics. Therefore, the initial stages of this work were not attended with success.

The Ministry of the Interior, under whose auspices the work was organized, was not vitally concerned with the welfare of animal husbandry and had dealt with the epizoötics purely from a Veterinary Police point of view. Action could only be taken against the above mentioned epizoötics when their wide dissemination was sufficient to alarm the agricultural community ; and when their control, even with the requisite personnel and the necessary means, was well nigh impossible. Other epizoötics were left to run their natural course ; no attention was paid to prophylactic measures, and there were no effective methods of this kind evolved, except police regulations such as quarantine and prohibitions. Veterinary sanitary control over the products of animal origin was practically non-existent, and the treatment of sick animals was partly in the hands of private Veterinary practitioners ; but it was left mainly in the hands of " quacks " and " horse throwers " (konnoval).

At that time only one journal was published and this was in the German language, being entitled : " Meneoraliclien der Veterinär Medicia in Russland."*

Second period. With the introduction of Zemstvos in 34 provinces in 1864 these bodies were entrusted by law with the combating of all epizoötics. In other parts of the Russian Empire anti-epizoötic

Translator's note : In an article by Dr. A. J. Metelkin, entitled " Materials on the History of Veterinary Periodical Press in Russia and U.S.S.R.", published in *Vestnik Sovremenusy Veterinarvi*, N 19, 1927, we read on p. 577 " . . . up to 1840, although there were already two Veterinary Institutes in Russia, no special veterinary journal was published, and all rather meagre communications of a veterinary character were published in *The Military Medical Journal* (published first in 1823), *Annales of the Free Economic Society* (published in 1765), *Journal of the Ministry of the Interior* (published from 1829), *Agricultural Gazette*, and in other medical and agricultural periodicals.

" However, there appeared in 1823 a *Weekly for Horse-Fanciers* . . . and many veterinary subjects were discussed in its columns, but it was not a special veterinary journal, and it was but short-lived [1823–26].

" *Annal s of Veterinary Medicine and Animal Husbandry*, first published in 1840, should be regarded as the first Russian special veterinary journal."

measures were being carried out, as hitherto, by a Government Department, terribly deficient in qualified personnel. In 1912 there were only 351 provincial and local Veterinary Surgeons and Inspectors entrusted with combating epizoötics in 63 provinces and territories in which Zemstvos were not introduced. There was no general legislation dealing with anti-epizoötic measures on an Imperial scale. It was only in 1872 that the Imperial Government—under pressure from Local Governments—promulgated a law dealing with control of rinderpest; and in 1902 an attempt was made to control by legislation the spread of the contagious diseases of animals in general. Owing to the absence of general Imperial legislation, control measures carried out in Zemstvo provinces were based upon by-laws passed and approved by the general meeting of local Zemstvo; consequently, these varied a great deal in method and application. It is only natural to expect that, under these existing conditions, combating of epizoötics, successfully accomplished in the rest of Europe, was not attended with satisfactory results.

Owing to a law (valid for the whole of the Russian Empire) rinderpest was successfully eradicated within 15 years in those provinces of Russia in Europe which were provided with the veterinary personnel of Zemstvos and the Ministry of the Interior. The Government Veterinary Department had entirely failed to eradicate rinderpest from Transcaucasia, Eastern Siberia, and the Russian provinces in Central Asia. The prevalence of other epizoötics during the first and last five-yearly intervals of the period under review were as follows:—

	Diseases	*Years*	
		1883–7	1908–12
1.	Glanders	1,377	23,457
2.	Contagious pleuro-pneumonia of cattle ..	4,486	18,234
3.	Anthrax:		
	(*a*) horses	15,185	17,721
	(*b*) cattle..	9,401	16,483
	(*c*) sheep..	9,270	10,736
4.	Sheep pox	22,109	40,921
5.	Scabies:		
	horses (mange)	7,090	64,569
	sheep scab	4,872	43,443
6.	Rabies:		
	horses	43	637
	cattle	192	2,807
7.	Foot and Mouth Disease	94,635	1,258,570
8.	Contagious Diseases of Pigs	728	113,890

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Credit should be given to the Zemstvos for the introduction of gratuitous veterinary treatment of all agricultural animals by the qualified personnel employed by them. Such practice was unknown in other countries of the world. This measure brought about a closer contact between the veterinary personnel and the population and played an important role in helping to achieve the partial success which crowned the activities of certain Zemstvos in their fight against some epizoötics. It was under the guidance of the Zemstvos that cattle and horse insurance was first organized in Russia; this was carried out by the Veterinary Staff as part of their routine duty. The first veterinary bacteriological laboratories to manufacture vaccines, and specific anti-epizoötic biological products, were also organized by Zemstvos. Such a laboratory was first established in 1892 at Kherson, and in 1912, out of a total number of 29, 17 were owned by Zemstvos.

In 1898 the Ministry of the Interior founded a veterinary laboratory at St. Petersburg with the object, besides that of manufacturing biological products, of organizing research work and post-graduate courses for veterinary surgeons.

The Veterinary Staff of the Ministry of the Interior was mainly entrusted with the control over the movements of commercial animals; slaughter houses were under the control of veterinary surgeons employed by the municipalities of large cities; those in small towns were served by Government Veterinary Inspectors.

A characteristic feature of veterinary organization at that period was a marked lack of co-ordination of measures adopted by various departments: the Ministry of the Interior, War Office, Ministry of Crown Lands, State Stud, Frontier Guards, Zemstvos Municipalities.

Third period. Veterinary work in the Soviet Union was begun under very difficult circumstances:—

1. Very serious epizoötics, with which, as noted above pre-war veterinary organization, the Government had been unable to deal successfully, were widely disseminated during the periods of war and civil war.

2. With the abolition, after revolution, of a Veterinary Organization of the Ministry of the Interior, Veterinary quarantine stations along the eastern frontiers, established to prevent the danger of rinderpest, ceased to exist *de facto*, with the result that this epizoötic spread over the territory of Russia in Europe in 1895 and from Transcaucasia invaded 22 provinces. A permanent menace of its spread from the countries where this disease existed enzoötically [China, Mongolia, Afghanistan, Persia and Turkey] was created.

3. With the disestablishment of so called "resident" Government Veterinary Inspectors the control over the movement of animals on

railways, waterways and roadways, ceased. This factor again resulted in further dissemination of all sorts of epizoötics and, finally, the hitherto existing legal regulations on veterinary sanitary control and combating of epizoötics became inoperative.

Under the stress of these grave circumstances, the Veterinary Board of the R.S.F.S.R., and the Veterinary Departments of other Republics of the Federal Union, which were entrusted with this task, could only expect to successfully deal with the problem of eradication of epizoötics : (1) By enlisting a requisite force of qualified veterinary personnel ; (2) By mobilising the available supply of biological products and vaccines as being of paramount importance in the armoury of anti-epizoötic measures ; (3) By organising a systematic control and ensuring the co-operation of the agricultural population.

With this purpose in view all available Veterinary Surgeons were fully utilised by the Central Authorities for carrying out the most essential measures of control in the provinces affected ; and to provide for the deficiency of qualified workers new centres of instruction in Veterinary Science were established. In addition to the four Veterinary Institutes, Kharkov, Kazan, Saratov (formerly Darpot), and Novocherkussk (formerly Warsaw) new Veterinary Colleges were founded at Leningrad, Vozonej, Omsk, Moscow, Kiev, Vitebsk, Erivan, Alma-Ata, Sumara, and Ural ; fourteen altogether, with 10 Veterinary Schools for assistant Veterinary Surgeons (Feldsher).

Further, immediate steps were taken for preparation and promulgation of laws, on the basis of which a systematic control of epizoötics could be made possible.

Then, instead of the 29 veterinary bacteriological laboratories which existed in 1912, with an annual output of 7,605 litres of biological products, there were established on the territory of U.S.S.R., in 1927, 68 laboratories with a total annual output of over 60,000 litres.

In addition to that a large number of research Institutes were founded in various centres, viz. the Institutes of Experimental Veterinary Medicine at Moscow, Kharkov, and Chita.

One of the first tasks successfully achieved by Veterinary Science in the Soviet Union was the eradication of rinderpest within 4½ years.

With the eradication of this epizoötic and the promulgation of uniform laws dealing with all aspects of veterinary activities in the Union it became possible to control systematically other epizoötics, and to solve a number of agricultural economical problems which Veterinary Science was called upon to do in connection with : (1) The resuscitation and preservation of animal husbandry ; (2) Creating favourable veterinary sanitary conditions for the realization and trade in animal products ; (3) Protection of national health.

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The reconstruction of agricultural economy of the Union commenced in 1929 necessitated the formation of a Federal Commissariat of Agriculture with an independent Veterinary Board.

It devolves upon this Board to regulate general veterinary measures and to reform veterinary education.

The latter proceeds along the lines of creating special sections: veterinary, sanitary, epizoötiological, and clinical, at the existing Veterinary Schools, where students are fully instructed in methods of control of contagious and non-contagious diseases of live-stock under the new conditions of enlarged collectivised and socialised agricultural industry.

THE RUMINATION REFLEX IN THE OX.

By PROF. DR. J. WESTER,
Utrecht.

UNTIL recently the physiology of the motor function of rumination was completely unknown—I published 1923[1] and later in my book "The Physiology and Pathology of the Fore Stomachs of the Ox, 1926," the result of single investigations on the function of the œsophageal groove in the ox. The œsophageal groove in adult animals has the function of intermixing the food, fluid present in the reticulum being passed over into the psalterium and true stomach so that in every contraction of the reticulum the lips of the œsophageal groove open and contract.

By this mechanism each time also the contents of the reticulum is caught up by the œsophageal groove and supported by suction, that occurs as a result of receptive slackening of the rumen, until it is pressed forward into the vestibule of the omasum.

From here the food is pressed out between the leaves of the reticulum by muscular contraction. The opening and closing of the œsophageal groove results in normal cattle about 2 or 3 times a minute, i.e. 3,000 to 4,000 times in 24 hours. If now in every contraction and suction 10 c.m. of fluid is transferred, then in 24 hours not less than 30 to 40 litres of fluid intermixed with food will escape from the reticulum into the rumen and true stomach. In ruminants the œsophageal groove opens wider, contracts more powerfully and 3 times instead of twice. Also the rumen works more powerfully and as a result the transmission of food during rumination is quicker. In the first days of life for weeks the function of the œsophageal groove however is quite different. So long as the calf is only nourished on milk (or during the time, in which the fore-stomachs are not used for the reception of solid food) nature

provides that the mother's milk (also water) falls immediately into the true stomach.

In drinking the œsophageal groove closes reflexly and forms a closed tube. In its interior fluid flows along from the œsophagus through the rumen into the abomasum.

For water there is only a short transmission period in which the reflex is at times longer and weaker. After a few weeks all the water that is drunk passes no longer into the abomasum but into the reticulum. On the other hand I have discovered that for milk the reflex may continue for months or even for a year. Thirst stimulates the reflex. Much water drunk lessens reflex irritability considerably.

The Mechanism of the Reflexes of the Œsophageal Groove.

The reflex—as always shown in experimental examination with the hand through an opening in the rumen—arises in the commencing portion of the œsophagus, i.e. in the pharynx. As a result of the contraction of the muscle fibres at the free edge the lips of the groove shorten (especially the left lip) to less than half. The cap of the groove which in a position of rest lies almost imperceptibly spread over the œsophageal opening, stiffens also through muscle contraction and is pulled down through the drawing together of the lips of the groove. It covers the cardia now as a cap (Fig. 1).

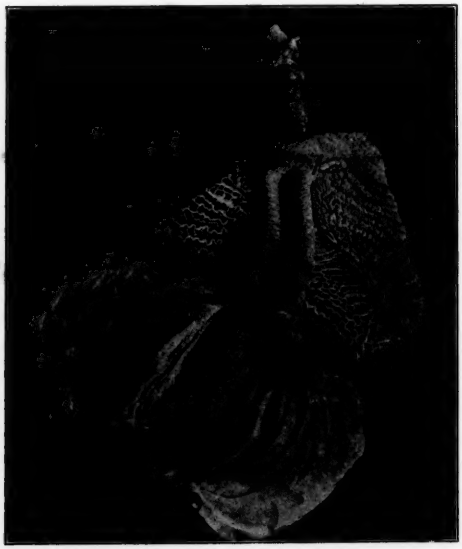

FIG. 1. Œsophagus; somewhat shrunken through being preserved in Formalin.

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The under edge of the cap lies 1½–2 c.m. under the œsophageal opening. Thus the left lip is stretched tight and the right lip less tightly stretched. Its position somewhat over the edge of the left lip and covers further below with a joined muscular pad the left lip completely. The bottom of the groove is thus slightly contracted (probably this depends on the fact that cross striped muscular fibres occur in it).

As a result a veritable tube arises. This would not be the case if the bottom of the œsophageal groove was not drawn tightly together. When the closure of the groove is strong, the entrance to the reticulum stands open and it slackens also the strong transverse fibres of the pad of the musculature, whereupon the bridge of the reticulum fails in its underneath part and the whole reticulum radiates out by means of the muscular reticular bridge and the muscle of the reticulum (Fig. 2).

The bridge of the reticulum under usual conditions always exercises pressure on the contents of the reticulum and effects the closure towards the true stomach (see illustration).

Through this relaxation an immediate union between œsophagus and true stomach is brought about (Fig. 3). The reflex has the effect of immediately giving access of fluid to the abomasum. Naturally some also runs along the leaves of the reticulum, but yet at least in a full reticulum most fluid goes into the abomasum and not first into the reticulum.

The closure of the lips or pillars can be more or less powerful. If the reflex is weak the lips are drawn more or less together and one cannot speak of a complete closure. If the reflex irritation is very powerful closure is complete. No drops of fluid can then reach the reticulum. Between them there are naturally gradual passages.

Immediately after deglutition the œsophageal groove closes. If one checks swallowing while a tube is placed in the œsophagus and milk given through it then the œsophageal groove does not close. In a calf a month old I have cut through into the œsophagus a few centimetres below the larynx so that fluid given per os made its appearance at the proximal stump. When milk was given per os, the œsophageal groove closed but only if the animal swallowed. Milk poured into the distal stump of the œsophagus did not cause closing of the groove.

After I had drenched the pharynx of a calf with cocaine solution (5 per cent.), and after a short time had allowed it to swallow, it showed a few minutes after given some milk that the reflex irritability had disappeared in swallowing. On painting the pharynx of a grass calf with cocaine solution the reflex irritability had declined somewhat but not completely disappeared.

From these tests I draw the conclusion that the reflex irritability depends on the ends of the vagus nerve in the pharynx and also the mechanism of deglutition.

FIG. 2. Ps.: Reticulum; Ps. br.: Bridge of the reticulum; L.m.: Stomach. The bridge of the reticulum ends in a strong transverse muscular pad, which presses against the contents of the reticulum and effects a closure towards the true stomach. There is no sphincter.

However swallowing alone does not excite the reflex. For in older animals the œsophageal groove does not close if the animal swallows water and food, but it closes eventually if milk or fixed salts are given to drink. *The reflex depends also on chemical irritability.*

The Chemistry of the Reflex of the Œsophageal Groove.

The reflex remains for milk much longer than water but disappears little by little for each.

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In an 8 year old cow the whole quantity of the milk landed in the reticulum. In two young cows 1 and 2 years old the milk always arrived in the abomasum. In a $2\frac{1}{2}$ year old cow the reflex for milk was quite absent, yet in a 4 year old cow it was quite complete. Besides age the reflex also depends on individual susceptibility. On which account it is recommended to use only cows up to 2 years of age in such tests. Then one is pretty certain that one always has an animal reflex susceptible for milk although no longer for water.

The fact that not only in calves but in older animals the reflex of the œsophageal groove is still present for milk made it possible to study the reflex more closely by means of rumen fistulæ.

I asked myself: By what chemical material or materials is the reflex in the swallowing of milk excited?

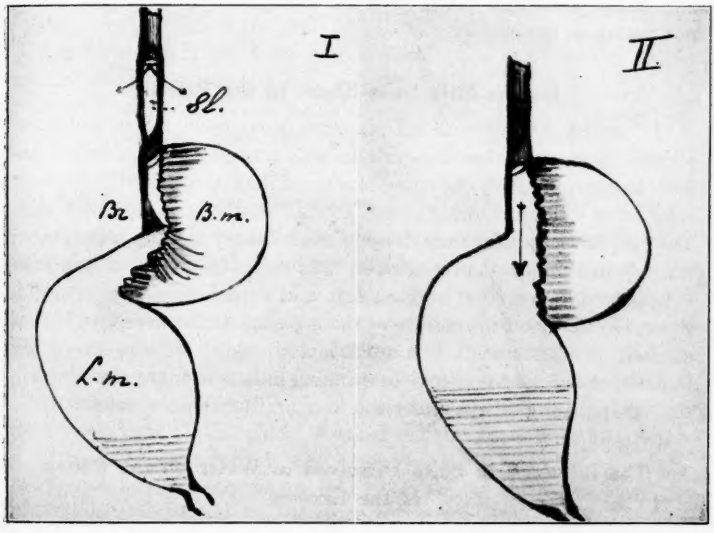

FIG. 3. R.: Œsophagus; Br.: Bridge of the Reticulum; Ps.: Reticulum; L.m.: Stomach.
I. The Œsophagus open, the Reticulum closed.
II. The Œsophagus closed, the Reticulum open.

Investigations teach me that the enzyme in the milk, the milk sugar, butter fat, and casein, do not close the œsophageal groove. But it was evident that in the swallowing of blood, blood serum, animal lymph, of dried albumen of blood (6 per cent. solution) and of liquid peptone, the reflex of the œsophageal groove is aroused (even stronger) as with

milk. Blood serum with its 7 to 10 per cent. protein caused closure in my experimental animals although in a dilution of 1 in 4, which milk does not do. Milk which only contains 3 per cent. albumen can be diluted at most 1 in 2. Also dried egg albumen (10 per cent. solution) caused weak closure of the groove.

The fact that blood serum, and also dried albumen from blood in a concentration about what occurs in blood, cause a reflex, proves that in each case the albumen in the milk which is identical with it in closure of the groove by the swallowing of milk, plays a part.

What rôle the globulin plays I have not been able to make out. Globulin as such does not occur in trade. Above all I have noticed that the first colostrum, which contains very much globulin, if it is diluted, appears to produce about 4 times as strong a reflex as milk from old milking cows, which have calved about a couple of days previously and whose colostrum contains much less globulin; also the reflex is not nearly so strong.

Do the Milk Salts Share in the Reflex?

I conducted trials with 0.7 per cent. of common salt in water and effectively showed that this salt in this concentration in water and even in lesser strength can cause closure of the groove. A 0.5 per cent. solution of sodium chloride causes a reflex as strong as that with milk. The conjoint milk salts may share in the reflexory closure of the groove but not in the mass as revealed by this test. On closer examination it appeared to me that sodium salt and especially sodium chloride works electively on the closure of the groove. Other salts (potassium, calcium, magnesium) do this much less strongly. It was shown also that the closure of the groove in drinking milk is brought about chiefly through protein perhaps under the co-operating effect of salts.

The Influence of Salts Dissolved in Water on the Reflex of the Groove.

In two 2 year old cows susceptible for milk but not for water it appeared to me that sodium chloride 0.2 per cent. in water caused closure of the œsophogeal groove. (The water used was Utrecht water containing almost no salts, or distilled water.) This closure was present 3 to 4 hours after the animals had drunk 7 to 10 litres of water. Also a concentration of 0.1 per cent. sodium chloride in distilled water causes moderate contraction of the lips of the groove, in a lesser concentration this was no longer the case.

Sodium bicarbonate causes as strong a reflex irritation as common salt. A 2 per cent. sodium sulphate solution causes moderate closure

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after some fluid has already penetrated into the reticulum. A 5 per cent. solution causes a quick and strong closure.

In general it may be declared that sodium salts in like concentration cause much stronger reflexes than the salts of other alkalies or metals. In these two cows, susceptible to milk, I noticed the following :—

Sodium sulphate in a 5 per cent. solution caused strong closure of the groove.

One per cent. magnesium sulphate solution caused no closure ; potassium sulphate occupies a middle place.

Sodium chloride 1 per cent. causes strong closure.

Magnesium chloride 5 per cent. causes no closure.

Potassium chloride 5 to 10 per cent. also no closure.

One per cent. sodium bicarbonate causes a strong reflex.

Five per cent. potassium bicarbonate does not cause a reflex.

Sodium nitrate 3 per cent. strong reflex.

Potassium acetate 3 per cent. no reflex.

Sodium iodide 1 per cent. causes some closure, potassium iodide does not.

Sodium bromide 2 per cent. causes some closure ; potassium bromide, 5 per cent., does not.

The Influence of other Medicines on the Reflex of the Groove.

By experimental examination on young cattle with fistulæ and not susceptible to milk I found the following :—

Sugar (beet as well as cane) in a 5 per cent. watery solution caused rather strong closure, in a 10 per cent. solution very strong. Dextrin 10 per cent. a weak closure, maltose 10 per cent., no closure at all.

Milk sugar in a 10 per cent. solution causes a slight closure after a long reflex period and this is not complete. One imagines perhaps that a sweet taste plays a part. But against this I found that *saccharin* in a concentration which is much sweeter than 10 per cent. sugar exercises no influence on the groove. Also *sour* or *bitter* substances do not influence the groove.

Alcohol acts capriciously. A 35 per cent. solution does not generally excite the reflex. All other ordinary drugs used in usual concentrations do not influence the reflex. *Chloral* acts now and then, but not always.

From the above investigations certain important conclusions may be come to as regards practice :—

Whether in practice a certain remedy comes immediately into the abomasum the following circumstances must be borne in mind :—

1—If one passes the probang and introduces it a few decimetres into the œsophagus one can pass everything into the reticulum,

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the groove does not then close. If one wishes to pass medicine into the true stomach, one must give it per os.

2—The closure of the groove results after a distinct reflex period, as is the case in every reflex movement.

The length of the reflex period, in other words, the quickness with which the groove closes, is dependent on the strength of the reflex irritation and is proportionate to it.

3—The greater or less completeness of the closure of the groove depends also on the strength of the reflex irritation. After a very weak irritation and after a long reflex period the lips only come together without closing. As the result of a strong irritation the lips contract firmly immediately. Thus a tube is formed and everything passes into the abomasum.

4—Single organic materials arouse specific reflex irritation (colostrum, milk, powder dissolved in water 13 per cent., fresh buttermilk, fresh yoghurt, blood, blood serum, albumen, peptine liquid).

5—Also sodium salts and sugar act in this direction specifically. Other salts also act in stronger or very much stronger concentration.

6—The quickness and strength with which the groove closes depends on the concentration of the irritating material. The stronger the concentration the greater the quickness and strength of the closure.

7—Through the swallowing of water only in the first weeks of life is the groove closed.

8—In older cattle the reflex irritability diminishes little by little for milk and for other specific irritating substances. Very strong concentrations of sodium salts, sodium chloride, sodium bicarbonate, or sodium sulphate (10 per cent. and higher) always arouse the reflex in older animals.

9—In certain individual animals a high reflex irritability may occur so that milk and sodium salts in weak concentration may bring about closure of the groove.

10—Diseases, especially diseases of the digestive apparatus, lessen reflex irritability. The specific acting substances bring about the reflex in strong or very strong concentration.

11—A combined action of irritability increases the effect of the reflex; common salt in milk acts more strongly than milk or common salt alone.

12—A more powerful irritation arises when the groove remains close for some time; also after the irritating fluid has passed on.

13—Thirst heightens reflex irritability.

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We can put these Findings to Practical Use.

In healthy young cattle up to 2 years old, one is in a position, apart from the specific acting substances (milk blood, sodium salts, sugar solution) to pass also almost every other medicinal remedy into the true stomach, if one unites it with one of the substances as transport material.

The preference as transport materials comprise milk and solutions of sodium bicarbonate or common salt and also blood, blood serum and sugar are quite good to use as transport material. Alcohol passes into the abomasum with sodium bicarbonate 2 per cent. or sugar 5–10 per cent. A mucilaginous venetian talc serves well.

Styplics (tannin preparations) and antiseptics (creolin and creosote vasogen) pass into the abomasum in young healthy cattle after they are given with milk, or milk with sodium bicarbonate, or in watery solution of sodium bicarbonate. One must not however dilute the milk too much. With equal quantities of water action is only weak. On this account mucilage is not given with milk but with soda bicarbonate.

Acids (1–3 per cent.) can pass with milk into the abomasum.

Antiparasitics can pass with sodium bicarbonate, colostrum, milk, blood, blood serum or sugar into the true stomach.

Small capsules, filled with drugs, can come immediately into the abomasum in the same way, given with water they fall immediately into the reticulum. Copper sulphate dissolved in milk (1 per cent.) comes in cattle susceptible for milk, into the true stomach, but only if the solution is prepared fresh ; the copper salt soon denatures the milk protein.

All this—I repeat—is only certain for young, healthy animals.

As far as it relates to older and sick animals is not certain. However, one must accept the standpoint that milk and weak concentrations of salts do not produce a reflex in older and sick animals and that on this account in those animals a stronger irritation—namely by stronger concentration of a sodium salt (sodium bicarbonate or common salt) as transport means—must be used if one would reach the abomasum with the medicament. But one should recollect that the mucous membrane of the true stomach is very susceptible and one must therefore avoid bringing irritating substances direct into the abomasum.

For most practical uses the published statements here may be of use in the ridding of worm infestation in the gastro-intestinal canal. It will be very inacceptable if drugs fall into the rumen and not immediately into the abomasum. These diseases occur especially in young animals.

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One will be most likely to bring the antiparasitics directly into the abomasum if one observes the following :—

1—One does not use a probang.

2—One gives the animal no water for 24 hours.

3—One gives a concentrated solution of sodium bicarbonate per os in order to cause the reflex. In the ox e.g. 200–400 grammes of a 5 to 10 per cent. solution—in sheep and goats 100–200 grammes.

4—One gives the drugs (if possible in small capsules) with blood, blood serum, milk or better still 5 to 10 per cent. sodium bicarbonate for this causes a stronger reflex than milk or blood. In goats and sheep one uses the small hard gelatinous capsules 100 milligrammes content ; in calves and young stock 500 milligram capsules.

5—One washes them down by means of sodium bicarbonate solution. *G.M.*

TRANSPORT OF PARTRIDGES ON LAND AND SEA.

By D. S. LAND, G.B.V.C., F.Z.S.,
Superintendent, Municipal Gardens, Bombay.

One of the principal functions of a Curator or Superintendent in charge of a Zoological Collection is the great attention and thought he is required to pay to the transport of animals and birds whether on land or sea. The collection has to be transported in strong, roomy boxes or crates so that there is no overcrowding, taking care that the crates are not heavy or unnecessarily large with a view to reduce the cost of freight to a minimum, as the freight charges by Steamship Companies on crates are on the cubic space occupied, and on Railway either on cubic space or weight. Considerable attention is also required to the feeding and watering arrangements during the transit, so that the collection may reach its destination in healthy and sound condition.

At present I propose to deal with the transport of Partridges whether on land or sea.

For the Partridges, which may be Chukor, Black Francolin, Common Grey Partridge, Crested Wood, Painted or See-see Partridges or Quails, the transport cage should be made of country planks or from planks of old kerosine oil cases or packing cases. Planks should be fixed on three sides and the front portion should be provided with wire netting—gauge about $\frac{1}{2}$ in. or so. Size of the cage 4 ft. $\times$ 4 ft. $\times$ 3 ft. In this cage about a dozen Partridges could be safely accommodated. A

perch should be provided lengthwise in the cage. The upper inside portion should be lined with Gunny cloth as padding so that the birds may not be injured on the head. On the floor, coarse sand or gravel should be spread. If this floor is provided with a tray, which can be drawn out for cleaning, the arrangement would be most satisfactory. A small enamelled dish with flanged edges should be kept for food, etc., and a small shallow enamelled cup for fresh water which should be supplied twice a day. Grain should be fed once.

Feed : Partridges may be fed on Bajri (Bulrush millet—Pennisetum typhoideum) or in the mixture of the following :—

Bajri (Pennisetum typhoideum),
Jowari (Serghum vulgare),
Rice (Oryza sativa) unthreshed, and
Indian corn (Makka or Zea maize).

Besides green food in the form of vegetables, if available, may be given like leaves of Moola (Radish), Methi leaves (Fenu Greek—Trigonella Foenum graecum) and Onions (Allium cepa), etc., or various vegetable salads. All to be crushed and given once a day. Eggs, if available, should be boiled and crushed and given with green vegetables. A handful will be sufficient.

For a journey lasting for say 15 days, about 20 seers of mixed grain would be sufficient (1 seer of mixed grain—$1\frac{1}{4}$ lb.). The food and feeding arrangements on board the ship is entrusted to the butcher of the ship, to whom a small gratuity is paid.

With regard to the transport on railways, the journey is more or less of short duration—about three days the most from say—Calcutta, Lahore, Delhi, or Madras, to Bombay. The enamelled dish should be kept full of grain, and arrangements made for plentiful supply of water daily with the train attendant or guard of the train.

A FEW NOTES ON S.U.P. 36.

By A. STEWART WATSON, M.R.C.V.S.,
Westcliff-on-Sea.

It is possible that S.U.P. 36 is not yet in general use with the members of the Profession. It is a valuable drug, but may I beg that it be exhibited with discretion lest it fall into disrepute with promiscuous use. Pushed under the skin of a dog whose complaint has not been diagnosed, it will prove as valueless as many other excellent new preparations have done. Used empirically the new productions of the scientific chemist are as lacking in magic as the old remedies.

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May I, as a young practitioner, respectfully offer this little thought to the more elderly when they act as consultants.

From experience of over twelve months with this drug I offer the following notes and suggestions.

It is in the early stages of distemper that this agent is perhaps of greatest value. Choosing one's case carefully it is almost a specific: within twenty-four hours the temperature drops, the animal returns to food and one has difficulty in impressing upon clients the need for further care and nursing. I assess the dose approximately at one minim per pound body weight (up to eighty minims) and inject either intramuscularly or subcutaneously; repeating the dose in 48, 72, or 96 hours at my discretion. Once the secondary and tertiary invaders are painting your clinical picture S.U.P. 36 is not so good, indeed I prefer serums and saline transfusions in some cases.

In suppressed distemper, the worry of the practitioner, the drug is again of value. I push the dosage somewhat, giving it daily up to four days, or if my feelings dictate alternate it with salines ($\frac{1}{2}$–1 pint). When I say as my feelings dictate I refer to what at times appear to be almost instinctive warnings of nervous developments.

It is in suppressed distemper that I feel one may have at times a definite contra-indication for S.U.P. 36. The animal has perhaps been ill for some time and the heart in consequence shows obvious trouble. One probably feels that the routine injection of camphor or saline is indicated. If one is tempted to use S.U.P. on account of its previous success, the patient may be dead within twenty-four hours.

I have not any evidence from the makers that the drug is dangerous in " toxic heart " cases, but my own experience leads me to believe that it very definitely is so. In cases of pneumonia, too, it is of value early in the case but must be used warily or not at all towards the end.

In metritis in bitches and cats I have better results alternating injections of S.U.P. 36 and pituitrin than with pituitrin alone—of course in conjunction with routine internal medication as well.

In three cases of puerperal fever—not Eclampsia—I have seen within the last six months, S.U.P. and salines brought the affairs to satisfactory conclusions.

As regards local septic conditions S.U.M. appears of more value than S.U.P.

In cats suffering from chloroform poisoning S.U.P. proved very useful, but I have changed my brand of anaesthetic chloroform lately and my opportunities of further experimentation have ceased.

There are doubtless other cases in which S.U.P. may be of value, but it is the practitioner's part to try it out on his own patients, and not for the consultant to exhibit as a new cure-all.

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Finally, I must offer my thanks to Captain Dunlop Martin, until recently my senior, probably one of the first veterinary surgeons to apply S.U.P. to canine work, who put plentiful supplies of this agent at my disposal, and was ever helpful in his discussions and suggestions. Also to Mr. R. E. Alexander who found to his own satisfaction its value in cases where my suggestions to him indicated its use.

Clinical Articles

Novasurol and Ascites of the Dog.

By G. N. GOULD, JUNR., M.R.C.V.S.,
Southampton.

SINCE Professor J. G. Wright's report of the use of Novasurol in the treatment of Ascites of the dog I have had occasion to use it in two cases, in both of which the result was highly satisfactory.

The first case concerned a Cocker Spaniel dog, aged seven years, which was first ill in November, 1929, but which did not come to my notice until late in January, 1930. The previous diagnosis and treatment I am not aware of, but when I examined the dog I found it to have Ascites, the abdomen being greatly distended and pendulous, pulse small and weak, bodily condition extremely poor, with dyspnœa especially noticeable on the slightest exertion.

The owner wished every effort to be made to prolong life, and following the unsuccessful use of paracentesis abdominis and administration of potassium iodide and digitalis I suggested laparatory both as a possible curative measure by setting up a filtration angle by adhesion of the mesentery to the parietal peritoneum and also to discover if possible the cause of the condition. This operation I performed on February 15th.

A large amount of ascitic fluid was liberated—quite a gallon. I could find no evidence of chronic liver disease, or tubercular lesion of liver or mesentery glands or spleen, and was unable to satisfy myself as to the cause of the condition. The absence of these possible causes, however, gave greater hope of cure.

The contents of the abdomen were swabbed with chinosol (1 in 1,000) a portion of the mesentery stitched to the abdominal wall to establish a filtration angle and the operation completed in the usual way.

There was no return of Ascites. Healing occurred by first intention and the dog gradually improved in condition, until it appeared quite normal about six weeks after the operation.

I was called in again on July 24th and found the dog to have had a recurrence of Ascites. On this occasion the dog was in excellent

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bodily condition and showed but little dyspnœa on exertion. Ascites had developed very suddenly for no sufficiently clear reason.

I communicated with Professor Wright, who gave me particulars of the Novasurol and Ammonium chloride treatment and prescribed an injection of 1 c.c. Novasurol every fourth day for four doses with ten grains of Ammonium chloride in water three times daily.

A diet of raw and cooked meat and milk was prescribed.

Twenty-four hours after the first injection the dog passed urine copiously, and within two days a considerable decrease in the abdomen had occurred.

Prior to the second injection the dog looked but half the size, the dyspnœa was less marked and the appetite continued normal.

After the third injection the diuretic action was not marked, and all traces of Ascites had disappeared. A fourth injection was given and the Ammonium chloride reduced to five grains three times daily, to be discontinued at the end of seven days.

Recovery was complete—the dog is now fit and well, has put on more weight and is extremely active with no distress evident on exertion.

The second case concerned a Fox-hound puppy bitch, aged 11 months, which had been used with Drag Hounds.

She had been losing condition and was noticed to lag during the hunt. Finally the abdomen was noticed to be pendulous. I saw her and diagnosed Ascites due to dilation of the left ventricle. The owner was anxious to save the bitch, and when I explained the possibilities of cure with "Novasurol" and the probability of a compensatory hypertrophy of the heart muscle occurring in the event of cure, which would leave the bitch comparatively normal, he agreed to the treatment

She was treated similarly to the spaniel. Diuresis was more marked and was as in that case noticeable chiefly about twenty-four. hours after the injection.

The abdominal distension rapidly disappeared and appetite increased, excessive thirst disappeared and dyspnœa became less marked until it was not noticeable. The treatment was complete on August 19th, by which time the bitch was in fairly good bodily condition.

I have seen her again in the last few days and she is now taking normal exercise, has improved greatly in condition and shows no distress on exertion. There is no evidence of Ascites.

I found the injection to cause pain for an hour or two after administration, this was avoided by exercising immediately after injection, the exercise probably inducing more rapid absorption.

Novasurol is a double compound of sodium mercurio-chlor-phenyl-oxy-acetate and diethyl-malonyl-urea. I wish to thank Professor Wright for his kindness in giving me particulars of the treatment.

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Fracture of the Femur in the Dog.

By R. E. ALEXANDER, M.R.C.V.S.,

Leigh-on-Sea.

A FEW weeks ago, in company with Mr. Stuart Watson, M.R.C.V.S., I examined a valuable shooting dog brought in with a fractured femur. It appeared to be a bad break, although not unusually so, but as we could not guarantee that the animal would not limp after treatment the owner requested us to destroy the animal, which was accordingly done.

The *post-mortem* results were very surprising, in that the damage was much more serious than was anticipated. Cutting down to the bone a tremendous bloodclot was encountered, and the femoral vessels were found to be completely ruptured. The femur was broken longitudinally along the shaft, exposing the bone marrow for most of its length, and there were actually two breaks, one near each joint. The accident was the result of concussion, the dog having jumped out of a motor car.

I made a sketch of the broken fragments, but out of regard for the artistic sensibilities of my fellow members I refrain from sending it up. The moral is, of course, that although the majority of fractured femurs can be patched up, it did not apply to this case, and that sometimes the damage is much worse than is revealed by palpation.

Extraordinary Vitality in a Dog.

By W. P. BLOUNT, M.R.C.V.S.,

Folkestone.

Subject: A fifteen months' old Dalmatian dog.

History: When first attended (6th August, 1930) the patient was off colour, having difficulty in getting into a chair, which stiffness the owners thought might be due to rheumatism. The temperature was 104.5° F. but the dog was eating well. The following day the temperature had fallen to normal. The only other abnormal feature was the fact that preparations containing oil could not be tolerated by the mouth and vomiting would immediately occur. On the 11th August, 1930, the temperature had risen to 102.2° F. and the dog was again off colour. The attending veterinarian considered that the case was possibly one of suppressed distemper, and later, as there was definite constipation present, gave enemas and cascara evacuant (29th August, 1930). A few days later the animal developed a partial paralysis of the tongue and pharynx, he

could, if the head were raised and fluid poured into the mouth, swallow, but with difficulty: voluntarily he was not able to partake of nourishment. Obviously his condition was anything but robust, and for several days he lost flesh. An injection of "Aricyl" was given with a view to assisting the animal to overcome the paralysis. The same evening, whilst given the freedom of the garden, he vanished and was not heard of for 36 hours. During that period very heavy rain with thunder and lightning was experienced. The days were reasonably warm, but the night temperature was decidedly cool. When found (after he had been seen wandering across the hills for some time previously), he was offered warm milk but was unable to drink it. Weak bodily, but still not without spirit, the dog was given, as soon as seen by the attending veterinarian, an injection of adrenalin subcutaneously, and camphor in oil intramuscularly. The dog was taken home and received every hour small quantities of Brand's Essence of Beef, milk and brandy as directed. The temperature was 98.5° F., but when visited two hours later to administer a nutrient enema it had fallen to 97.8° F.; the enema was retained, but during the evening sickness occurred several times. The milk and Brand's Essence were replaced by "physiological saline solution" (as detailed in the *Veterinary Record*, 21st June, 1930) and, except after the first dose, no further vomiting occurred. Hot-water bottles having been applied previously and the animal rugged up, suitable nourishment and stimulants were given hourly for the next 12 hours. The following morning the temperature was 97.5° F. and the pulse very weak indeed, scarcely perceptible. Adrenalin was again administered subcutaneously. During the day, after similar care and attention, the dog recovered somewhat and at night appeared stronger, although the temperature was still three degrees below normal. He lived until 5 o'clock the next morning, that is to say about 36 hours after his return from wandering abroad. During this period the temperature never reached 99° F. Immediately preceding death vomiting occurred.

Post-Mortem: Revealed an active gastro-enteritis with fluid hæmorrhagic fæcal contents. The gall-bladder was over distended, being quite as large as the average hen's egg. The only brain lesions were a general softening of the cerebellar substance, and numerous small cerebral hæmorrhages.

Discussion: One wonders whether the general knowledge of the predisposing factors in pneumonia are as complete as we believe them to be. Here was a dog obviously suffering from malnutrition, in ill-health, exposed to rain and cold for many hours during a week-end, when it could not possibly have taken nourishment, and yet *pneumonia* did not supervene. Presumably the animal harboured the pneumococcus

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and other organism of pathogenicity in its respiratory tract, and yet, under such ideal predisposing conditions the disease did not develop! The *post-mortem* showed the lungs to be normal macroscopically. Theoretically, one can assume that whatever caused the paralysis and the apparent insanity was antagonistic environmentally to the pneumococcus: or that the animal's body temperature was *too* low for the minimum growth temperature of the organisms: or that the animal had high resistance to pneumonia. (It so happened that about this period we encountered about half a dozen pneumonia cases.)

The inability to retain oils was presumably an idiosyncrasy, and not in any way related to the retention of bile in the gall bladder, which it was assumed was due to a mechanical partial blockage of the bile duct by the inflammatory process in the duodenum.

However, knowing the full history, and seeing the wonderful fight which the dog put up against death, the whole case appears to present several interesting features concerning vitality.

Pyloric Stenosis in the Dog.

By D. E. WILKINSON, M.R.C.V.S.,

Chigwell.

ALTHOUGH this lesion is of frequent occurrence in canine patients it has received but scant attention in veterinary literature, and in practice is probably generally grouped amongst the common gastric ailments such as gastritis and gastric catarrh.

The symptoms of pyloric stenosis are however sufficiently distinctive to admit of differential diagnosis whilst the appropriate treatment differs considerably from that suitable to gastritis.

The stenosis itself may be of a transient character yielding to treatment in three or four days; it may be more persistent requiring careful attention for several weeks, whilst the most obstinate cases may call for surgical interference if economic and other circumstances permit.

The early history and symptoms are those of vomition, with this distinction from the vomition of gastritis and gastric catarrh, that the vomiting is not persistent and only occurs after the patient has partaken of a meal. The intense thirst characteristic of gastritis is absent for the simple reason that the stenosis rarely, if ever, completely occludes the pylorus and the passage of thin fluids like water is easily accomplished,

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whilst the burning sensation associated with an inflamed gastric mucosa is also absent.

The appetite is, however, voracious, for the animal, after the first two or three days, is literally starving.

A pathognomic sign of pyloric stenosis is the fact that unless the pylorus presents a raw wound or an ulcer upon its surface the food taken is not instantly vomited as in gastritis, indeed it may be retained in the stomach for several hours until gastric digestion is completed. Then, when the dilatation reflex is called for, the peptonised meal is vomited.

The bowels are usually empty and loss of flesh is rapid, but as there is generally an absence of any inflammatory process or of toxæmia the case resolves itself into one of slow starvation and the animal does not immediately die if protected against shock set up by chills and exposure.

Such cases therefore afford time for treatment and are usually curable, although cases of sudden death when the hungry animal has gained access to a full, solid meal and when the stomach has NOT been relieved by vomition are not uncommon, three such cases in animals convalescent under careful dietary having come under the writer's notice.

The original lesion is probably always traumatic, the result of wounding of the pyloric sphincter by sharp bones, pieces of metal or splinters of wood.

One fatal case occurred in a tame Himalayan bear which was constantly gnawing splinters off a tree in its cage, whilst another case in a bull-terrier arose from its habit of chewing logs of wood.

Successful treatment depends chiefly upon careful dietary and good nursing.

The administration of gastric sedatives such as chloretone and the bismuth preparations is contra-indicated as it is important not to interfere with the functional activity of the gastric mucosa, nerve supply and peptic glands.

The animal should be warmly clothed and housed and all solid food rigidly withheld. In the early stages water may be freely given unless it tends to set up vomition. In that case it should be given sparingly and have a quantity of castor sugar dissolved in it. Loaf sugar may also be given dry in small amounts as it is invariably well masticated and a certain amount of absorption of sugar takes place from the stomach.

Once diagnosis is established steps must be taken to maintain the patient's strength and to prevent undue emaciation. For this purpose

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hypodermic injections of 5 per cent. glucose in water at 105° F. in quantities of from two to ten ounces should be given twice daily.

The diet should consist of whey and cold meat juice, mixed, to commence with. Later easily digested or pre-digested fluids of greater density such as milk or Benger's food may be tried but if they are rejected must not be persisted in until the pylorus has recovered and dilatation has taken place.

This may then be followed up by egg-custard and semi-solids, gradually paving the way to a return to normal diet.

If vomiting is persistent in the early stages and wounding of the pyloric mucosa is suspected from the vomiting of blood-stained mucus or pure blood it may be controlled by ONE dose of chloretone, which should not be repeated, followed by small particles of ice and the administration of an internal antiseptic, preferably Dimol in syrup. This should be given at frequent intervals to prevent infection and ensure early healing of the wound.

When the initial symptoms have subsided small doses of dilute hydrochloric acid should be prescribed in order to restore the activity of the peptic glands and thus possibly stimulate the pyloric dilatation reflex.

The patient may be laid upon its back and the stomach directly massaged with the finger tips thrust gently under the xyphoid cartilage. During this process a distinct " squelching " can often be both felt and heard. Massage must not, however, be persisted in if it gives rise to pain.

Provided the bodily condition is fairly well maintained this line of treatment may be continued for two or three weeks, or even longer, with every hope of ultimate recovery.

The bull-terrier mentioned above, which was the property of a lady doctor, made an excellent recovery after two months of this treatment.

Should the case not respond operative measures may be resorted to.

Gastrotomy with forcible dilatation of the pylorus by means of the finger or a flexible sound is quite practicable.

The operation (on the human subject) is graphically described in Treves's " Manual of Operative Surgery " Vol. II.

The writer has however obtained recoveries in seven successive cases by a simple laparotomy, exposing the constricted pylorus and injecting the stricture with a solution of thiosinamin. The viscus is then well massaged between the finger and thumb before being returned to the abdomen. The resultant wound is a small one and the risk of sepsis and shock far less than in the case of a gastrotomy.

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Control and Treatment of Coccidiosis.

By W. R. KERR, M.R.C.V.S.,
Harper Adams Agricultural College, Salop.

COCCIDIOSIS as a disease of poultry is becoming a menace to the industry, second only in importance to B.W.D., and though its infection is not so readily disseminated, there is not the same possibility of elimination as in the case of the latter disease.

Work on the control and treatment of the disease was carried out during the spring of the year 1930, at the Harper Adams Agricultural College, Newport, Salop, and the following notes are intended as a preliminary report of the results obtained.

Control.

EFFICIENCY OF CHEMICAL DISINFECTANTS.

Experiments were set up to determine the value and efficiency of chemical disinfectants, and attempts were made to combine treatment with reasonable sanitary measures. The method used was to test the usual drugs or combinations of drugs generally advised in treatment against controls of untreated birds.

Results at the moment tend to show that the only method of control which can be advised with confidence is that of mechanical cleansing, and that disinfection by chemical means effects no control whatever, indeed in many cases it seems to assist the sporulation of the oöcysts than destroy them.

During the tests it was evident that in some cases artificial infection had been too severe as the subjects succumbed, and in some cases the controls fared better than the treated birds.

Treatment.

It is realised that drugs used for this purpose are limited in their action, and that results hitherto have been poor and inconclusive.

Most of them are supplied to the affected birds through the drinking water, and when such bodies as mercuric perchloride, potassium permanganate, hydrochloric acid, free iodine, etc., are used, enter into organic combination with the ingesta and mucous of the crop and gizzard, and are therefore inert bodies on reaching the intestine and

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cœca. Others have no direct action on the parasite but depend on symptomatic treatment, such agents as astringents for example.

Certain results have also been claimed for the use of dried milk, and similar products which affect a change of p.H in the intestine.

The oöcyst is impervious, but digestive experiments here show that the endogenous forms are easily destroyed by certain chemicals. To achieve this, it is essential for the agent to be in a free state at the lower portion of the intestines.

The possibility of iodine in this connection seemed impressive, and experiments were carried out to find the most convenient form in which it could be effectively administered. It was decided to use the power of casein to absorb iodine for this purpose.

Casein in milk can absorb large doses of iodine by the application of heat; and it was found by experiment that this combination did not affect the hydrolisis of protein and its ultimate absorption as amino acids, and also that iodine was set free to combine with other organic matter to be passed out in the excreta. This preparation seemed to fulfil the desired conditions, and its use was extended to field work.

The combination is as follows :—

IODINE SOLUTION

Iodine 1 part.
Potassium Iodide 2 parts.
Water 50 parts.

To 1000 c.c. of fresh or separated milk add 200 c.c. of the iodine solution, heat until it becomes white.

This is the stock solution, and 1 pint should be added to every gallon of drinking water used. The chemical nature of the complex formed on the addition of a solution of iodine is popularly ascribed to the formation of collodial iodine.

It is hoped that during this investigation additional evidence will be forthcoming, for or against this hypothesis.

Excellent results have been obtained by the use of this treatment on many farms in the West Midland Province, and it has been decided to continue the investigation of the mechanism of the treatment from both a physiological and chemical point of view. The chemical side of the work has been undertaken by G. H. Botham, B.Sc., Analyst at the before-mentioned College.

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Reviews

Poultry Diseases. By B. F. KAUPP, B.S., M.S., D.V.M. 5th Edition revised and enlarged. London: Messrs. Baillière, Tindal & Cox. pp. 436. Illustrations 166. Price 16/- net.

When a veterinary text-book has reached its 5th edition, and especially when it has done this within so short a time as this particular text-book, this in itself is a proof of its great value as a text-book, for the veterinary practitioner, the veterinary student, the agriculturalist, and the breeder of fowls.

Dr. Kaupp's name is known in every part of the world as one of the greatest authorities on the diseases of poultry, and his method of describing the various diseases to which the bird is subject, is as interesting to the laymen as to the scientific student of disease.

There is no book in any language which is more full of information on the diseases of the bird and their treatment, and we can with every confidence assert that no library, whether it be that of a veterinary or an agricultural college, or the library of a private practitioner or poultry breeder, is complete without a copy of this excellent work.

Sheep Diseases. By E. T. BAKER, D.V.M. 2nd Edition. London: Baillière, Tindall & Cox. pp. 299. Illustrations 100. Price 15/- net.

America has again given us the lead in regard to a text-book on the diseases of sheep, and Mr. Baker is to be congratulated upon the masterly way in which he has dealt with a subject which has become of such vast importance to the veterinary surgeon. The diseases of sheep now occupy a very important place in the life of the country practitioner, especially that part which deals with preventive medicine, and the veterinarian is called in very much more frequently in this connection than he used to be.

The need for an authoritative text-book on sheep diseases has long been felt. The work consists of some twenty-seven chapters commencing with the history of the various breeds and passing on to the general care and hygiene of the sheep in health to the diseases—infectious and otherwise—to which sheep are liable. Chapter II is devoted to the poisons which give rise to trouble and a final chapter deals with the quarantine and transportation troubles which control the numbers of sheep in the United States of America.

If any criticism can be made it is that the author has attempted to condense in a comparatively small space of 299 pages what might really have made a very much larger text-book; and if one might make the suggestion that the subject is of such importance that in a future edition the management of the sheep in health and the treatment of the animal in disease might well occupy, each of them respectively, a separate volume.

We can with confidence recommend this book both to the veterinary surgeon and the agriculturalist.

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Veterinary Pharmacology, Materia Medica and Therapeutics. By H. J. MILKS, D.V.M., with a chapter on Biological Therapeutics by Dr. A. EICHHORN, D.V.S. London: Baillière, Tindall & Cox. Pp. 539. 27 figs. 28/-.

NEW facts regarding the actions of drugs and their therapeutic indications are continually being brought to light, and thus it is with pleasure that we receive a recently revised edition of Milks' Materia Medica.

In former days the materia medica proper received much more attention than we give it to-day. The greater importance of pharmacology has been recognised. The author quotes the recognised standard works on the subject (Cushny, Sollman, Bastedo, and others); at the same time he acknowledges that he has drawn freely from current literature.

The opening chapters deal with pharmacy, dispensing and prescription writing in a most comprehensive manner and in this respect the book will be of value to both practitioners and students.

The pharmaceutical preparations, however, are those of the U.S. and not the British Pharmacopœia.

The doses quoted are orthodox and are given in both the imperial and the metric systems. (In this connection one might state here that the time has definitely arrived for uniformity in this matter. In research work findings are invariably quoted in the metric system and doses computed according to kilogrammes bodyweight. Yet clinicians, both in the Medical and Veterinary Professions continue to adopt the older and more confusing system.)

The subject of anthelmintics has been revised by M. C. Hall and W. H. Wright, two authorities on the subject. Carbon tetrachloride and tetrachlorettylene receive considerable attention; but we feel more might have been paid to the other anthelmintics, particularly toxicity.

Dealing with the general anæsthetics the author goes into the subject of pharmacology fully, but we feel that in a text-book of this nature the subject of administration might have been dealt with more fully.

Throughout the text are numerous examples of prescriptions. These are useful and practical; and serve to indicate the lines upon which prescribing should be carried out. The remedies mentioned, must of course, be translated into the corresponding one of the B.P. and doses corrected where necessary.

The last chapters on vaccine and serum therapy and the biological diagnostic agents are contributed by Dr. A. Eichhorn, who deals with the subject in a simple, yet comprehensive, manner.

Allgemeine Epidemiologie der Tierseuchen. By GEORG FRANCKE, D.V.M., and VIKTOR GŒRTTLER, D.V.M. Stuttgart: Ferdinand Enke. 1930. Pp. 278, with 19 figs. in text.

THIS is a book dealing with the epidemiology of contagious and infectious diseases of animals. It is composed of six sections, namely: A—The Organism or Virus causing Disease; B—Susceptibility to Infection; C—Modes of Transmission of Disease; D—Local Causes of Outbreaks; E—External Influences on the Origin and Spread of Diseases; —F

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Measures to be adopted on the Appearance, and in the Course of, Infectious Diseases.

It contains a pretty thorough and wide survey of all matters connected with the origin, control and stamping out of epidemics and is written chiefly for official Veterinary Surgeons under the German Ministry. On this account it should be specially useful to Inspectors of our Ministry of Agriculture.

The volume is well got up and of handy size and is interesting as being a reliable guide in that knowledge which is so necessary to bring preventive measures against disease into full play.

Mensch und Tier Im zyklus der Kontagiums (The Connection between Diseases in Men and Animals). 1st edition. By PROF. DR. W. SCHÜFFNER, Director of the Institute of Tropical Hygiene, Amsterdam. Stuttgart: Ferdinand Enke. 1930. Pp. 167. Reichs-Marks, 7. Bound in linen, 8.50 R.-M.

THIS is a valuable book. It is the second book on the subject to be published this year, the other being "Diseases of Animals Communicable to Man" by T. G. Hull, published by Baillière, Tindall & Cox and reviewed in the May issue of this journal. It furnishes much food for thought and shows the necessity and importance of close co-operation between the Medical and Veterinary Professions in the elucidation and prevention of outbreaks of disease.

Its contents cover a wide range and include not only diseases encountered in European countries but also those in Asia and the tropics. As far as we can see the author's views, when decided as to the transmissibility of disease, are in accordance with those generally accepted by scientists, and where there is some doubt he merely records the facts and leaves the reader to form his own judgment. As regards psittacosis he quotes the cases of human infection in France and America and mentions that instances have been recorded in Germany, Switzerland and Italy. He believes that septic sore throat in man occasionally arises from cows' milk in which streptococci are present, and that not a few cases of tuberculosis in man arise from tuberculous fowls—he states that 20 cases have been recorded in recent times and that some cases of lupus and supposed Hodgkin's disease in a child were due to the avian bacillus, but agrees that fowl tuberculosis (10 per cent. affected in Germany) is not so dangerous to human beings as to pigs. An interesting case (from the *Lancet*, December 8th, 1928) is mentioned. A case of diphtheria in the house and cow-pox in the shippon existed simultaneously. From the wounds of the cow's udder virulent diphtheria bacilli were recovered. Veterinary Surgeons will easily understand how they might get there. Bacteria, rickettsia (by *rickettsia* one understands a group of very small micro-organisms which chiefly occur in insects and as a rule are little injurious to them but in individual cases may be pathogenic for men and animals, e.g. spotted fever due to lice or ticks, filtrable viruses, spirochætes, protozoa, phytoparasites, insects and helminths), have each sections to themselves. If there is any desire for further knowledge among veterinarians and medical men this book ought certainly to indicate a large field that has as yet only been glanced at, and

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to furnish a counterblast to those who fear there is no sale for veterinary books. As an epitome of interesting facts in connection with the inter-transmission of diseases between animals and man the volume is to be commended. The problems of research which are forcibly brought to mind on a perusal of its pages furnish an almost endless list. G.M.

Personal

STUDENTS of the Edinburgh College will hear with regret of the death of Professor John Dunstan, who was, during the short time in which he held the Chair of Surgery, one of their most popular teachers. Born at St. Mellion in Cornwall, where his father had built up a large practice, John Dunstan entered the London College with a good foundation for the practical side of his profession, and, after a brilliant student career, he took his diploma in 1895. He served on the Council of the Royal College of Veterinary Surgeons from 1910 to 1919, being elected a Vice-President in 1911. After a few years' teaching in the Dick College, during which he was elected as a Fellow of the Royal Society of Edinburgh, Professor Dunstan returned to Cornwall, settling down in his old district at Liskeard, where he speedily built up a very large consulting and general practice. Unfortunately his health broke down and he was compelled to seek retirement. Intensely popular in his district, his death will be felt by a large circle of friends; and the sympathy of the profession will be extended to his family, who, by a curious coincidence, have sustained a still further loss by the sudden death of Professor Dunstan's brother, Mr. E. G. Dunstan, which took place two days later from heart disease. Mr. E. G. Dunstan was in practice at Okehampton.

PROFESSOR G. BARRIER--Hon. Inspector-General of the Veterinary Schools of France—has now reached his 77th year. For 36 years he taught in the Alfort School, acted as its Director for 12 years, and as Inspector for 12 years of the three French Veterinary Schools. He has been feted by "*l'Académie Vétérinaire*" of France on his academic jubilee, and his 50 years' connection with the French Veterinary Society has also been commemorated.

He sends us a cheerful letter on the future prospects of the profession and thinks that there will always be work for veterinarians in countries like England and France which produce in abundance all the breeds of domestic animals. He considers that economically horse traction will always beat motor traction. On the other hand the Public Services of National Defence, Sanitary Police and Public Hygiene will increase the importance and necessity of the veterinarian. He concludes that "We have good reason to speak well of the future and to be hopeful."

DR. HENRY DRYERRE, M.R.C.S., L.R.C.P., Ph.D., F.R.S.E., who has, during the last ten years, held the joint appointments of Professor of

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Physiology in the Royal (Dick) Veterinary College, and Lecturer in Physiology at Edinburgh University, has been appointed Physiological Biochemist to the Animal Diseases Research Institute, Moredun, Edinburgh.

While Dr. Dryerre will relinquish his University post, he will continue his Professional appointment at the Royal (Dick) Veterinary College.

Dr. Dryerre has been intimately associated with Dr. Russell Greig, the Director of the Moredun Institute, in the elucidation of the problem of Milk Fever, and he brings to the Moredun Institute not only a large experience in Veterinary Physiology, but a wide knowledge of technique.

Mr. W. S. Gordon, M.R.C.V.S., has received the appointment of Senior Bacteriologist.

Mr. Gordon, for the last four years, has been a Research Assistant at the Wellcome Research Laboratories, and is well known among south country flock-masters in connection with investigations into Lamb Dysentery and Braxy.

These appointments will mark a distinct accession to the strength of the Research staff of the Moredun Institute.

Messrs. P. A. Carroll, M. R. Kelly, D. H. Power, of Limerick, and Mr. P. McDonnell, Killaloe, have been elected by the Limerick Corporation as part-time Veterinary Inspectors under the Agricultural Produce (Fresh Meat) Act, for the city.

Stoke-on-Trent Watch Committee has expressed the view that the early appointment of a City Veterinary Surgeon is desirable, and has passed a resolution urging the Health Committee to deal with the matter as early as possible.

Mr. John Joseph Brennan, Castlecomer, Co. Kilkenny, and Mr. Martin Joyce, Enfield, Co. Meath, have been appointed as Veterinary Inspectors, Cork County Borough, in connection with the putting into operation of the provisions of the Agricultural Produce (Fresh Meat) Act, 1930; and Mr. Allison as Inspector of Dairies to the Limavady Rural Council.

Mr. J. Mullens has been appointed Veterinary Inspector at Wexford for the purposes of the Agricultural Produce (Fresh Meat) Act, which came into operation on September 1st.

The Local Appointments Commissioners have recommended Mr. Patrick Harnett, M.R.C.V.S., as the Veterinary Examiner for the city of Limerick under the Fresh Meat Inspection Act, at a salary of £450 a year. Two appointments under the statute have already been made, and there are three others to be made to the Borough Council.

Graduates of the Bombay Veterinary College will learn with regret of the death of Mr. Dabaker Dey, the late Assistant Principal. Mr. Dey was an earnest worker in the cause of Veterinary science, and will be much missed amongst his friends and old students.

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